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0160360en	001
0107	

Pump

PDT 2
PDI 2
PDT 3
PDI 3

OPERATOR'S MANUAL

0160360EN

CALIFORNIA

Proposition 65 Warning:

WARNING

Engine exhaust, some of its constituents, and certain vehicle components, contain or emit chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

1. Foreword

This manual provides information and procedures to safely operate and maintain this Wacker model. For your own safety and protection from injury, carefully read, understand and observe the safety instructions described in this manual.

Keep this manual or a copy of it with the machine. If you lose this manual or need an additional copy, please contact Wacker Corporation. This machine is built with user safety in mind; however, it can present hazards if improperly operated and serviced. Follow operating instructions carefully! If you have questions about operating or servicing this equipment, please contact Wacker Corporation.

The information contained in this manual was based on machines in production at the time of publication. Wacker Corporation reserves the right to change any portion of this information without notice.

2. Emission Control System Information

Source of Emissions

The combustion process produces carbon monoxide, oxides of nitrogen, and hydrocarbons. Control of hydrocarbons and oxides of nitrogen is very important because, under certain conditions, they react to form photochemical smog when subjected to sunlight. Carbon monoxide does not react in the same way, but it is toxic.

Wacker utilizes lean carburetor settings and other systems to reduce the emissions of carbon monoxide, oxides of nitrogen, and hydrocarbons.

The U.S. and California Clean Air Acts

EPA and California regulations require all manufacturers to furnish written instructions describing the operation and maintenance of emission control systems.

The following instructions and procedures must be followed in order to keep the emissions from your Wacker engine within the emissions standards.

Tampering and Altering

Tampering with or altering the emission control system may increase emissions beyond the legal limit. Among those acts that constitute tampering are:

•Removal or alteration of any part of the intake, fuel, or exhaust systems.

•Altering or defeating the speed-adjusting mechanism to cause the engine to operate outside its design parameters.

Problems That May Affect Emissions

If you are aware of any of the following symptoms, have your engine inspected and repaired by your servicing dealer.

•Hard starting or stalling after starting.

•Rough idle.

•Misfiring or backfiring under load.

•Afterburning (backfiring).

•Black exhaust smoke or high fuel consumption.

Replacement Parts

The emission control systems on your Wacker engine were designed, built, and certified to conform with EPA and California emissions regulations. We recommend the use of genuine Wacker parts whenever you have maintenance done. These original-design replacement parts are manufactured to the same standards as the original parts, so you can be confident of their performance. The use of replacement parts that are not of the original design and quality may impair the effectiveness of your emission control system.

A manufacturer of an aftermarket part assumes the responsibility that the part will not adversely affect emission performance. The manufacturer or rebuilder of the part must certify that use of the part will not result in a failure of the engine to comply with emission regulations.

Maintenance

Follow the maintenance schedule. Remember that this schedule is based on the assumption that your machine will be used for its designed purpose. Sustained high-load or high-temperature operation, or use in unusually wet or dusty conditions, will require more frequent service.

OXYGENATED FUELS

Some conventional gasolines are being blended with alcohol or an ether compound. These gasolines are collectively referred to as oxygenated fuels. To meet clean air standards, some areas of the United States and Canada use oxygenated fuels to help reduce emissions.

If you use an oxygenated fuel, be sure it is unleaded and meets the minimum octane rating requirement.

Before using an oxygenated fuel, try to confirm the fuel's contents. Some States / Provinces require this information to be posted on the pump.

The following are EPA-approved percentages of oxygenates:

ETHANOL - (ethyl or grain alcohol) 10% by volume. You may use gasoline containing up to 10% ethanol by volume. Gasoline containing ethanol may be marketed under the name "Gasohol".

MTBE - (methyl tertiary butyl ether) 15% by volume. You may use gasoline containing up to 15% MTBE by volume.

METHANOL - (methyl or wood alcohol) 5% by volume. You may use gasoline containing up to 5% methanol by volume, as long as it contains cosolvents and corrosion inhibitors to protect the fuel system. Gasoline containing more than 5% methanol by volume may cause starting and/or performance problems. It may also damage metal, rubber, and plastic parts of your fuel system.

If you notice any undesirable operating symptoms, try another service station, or switch to another brand of gasoline.

Fuel system damage or performance problems resulting from the use of an oxygenated fuel containing more than the percentages of oxygenates mentioned above are not covered under warranty.

EMISSIONS COMPONENT DEFECT WARRANTY COVERAGE

This emission warranty is applicable in all States, except the State of California.

Wacker Corporation, N92 W15000 Anthony Avenue, Menomonee Falls, WI 53051-1504, (herein "Wacker") warrant(s) to the initial retail purchaser and each subsequent owner, that this non-road engine (herein "engine") has been designed, built, and equipped to conform at the time of initial sale to all applicable regulations of the U.S. Environmental Protection Agency (EPA), and that the engine is free of defects in materials and workmanship which would cause this engine to fail to conform with EPA regulations during its warranty period.

For the components listed under PARTS COVERED, the service dealer authorized by Wacker will, at no cost to you, make the necessary diagnosis, repair, or replacement necessary to ensure that the engine complies with applicable U.S. EPA regulations.

EMISSISON COMPONENT DEFECT WARRANTY PERIOD

The warranty period for this engine begins on the date of sale to the initial purchaser and continues for a period of 2 years.

PARTS COVERED

Listed below are the parts covered by the Emission Components Defect Warranty. Some of the parts listed below may require scheduled maintenance and are warranted up to the first scheduled replacement point for that part.

(1) Fuel Metering System

(i) Carburetor and internal parts (and/or pressure regulator or fuel injection system).

(ii) Air/fuel ratio feedback and control system, if applicable.

(iii) Cold start enrichment system, if applicable.

(iv) Regulator assembly (gaseous fuel, if applicable) .

(2) Air Induction System

(i) Intake manifold, if applicable.

(ii) Air filter.

(3) Ignition System

(i) Spark plugs.

(ii) Magneto or electronic ignition system.

(iii) Spark advance/retard system, if applicable.

(4) Exhaust manifold, if applicable

(5) Miscellaneous Items Used in Above Systems

(i) Electronic controls, if applicable.

(ii) Hoses, belts, connectors, and assemblies.

(iii) Filter lock assembly (gaseous fuel, if applicable).

OBTAINING WARRANTY SERVICE

To obtain warranty service, take your engine to the nearest authorized Wacker service dealer. Bring your sales receipts indicating date of purchase for this engine. The service dealer authorized by Wacker will perform the necessary repairs or adjustments within a reasonable amount of time and furnish you with a copy of the repair order. All parts and accessories replaced under this warranty become the property of Wacker.

WHAT IS NOT COVERED

- Conditions resulting from tampering, misuse, improper adjustment (unless they were made by the service dealer authorized by Wacker during a warranty repair), alteration, accident, failure to use the recommended fuel and oil, or not performing required maintenance services.
- The replacement parts used for required maintenance services.
- Consequential damages such as loss of time, inconvenience, loss of use of the engine or equipment, etc.
- Diagnosis and inspection charges that do not result in warranty-eligible service being performed.
- Any non-authorized replacement part, or malfunction of authorized parts due to use of non-authorized parts.

OWNER'S WARRANTY RESPONSIBILITIES

As the engine owner, you are responsible for the performance of the required maintenance listed in your owner's manual. Wacker recommends that you retain all receipts covering maintenance on your engine, but Wacker cannot deny warranty solely for the lack of receipts or for your failure to ensure the performance of all scheduled maintenance. As the engine owner, you should however be aware that Wacker may deny warranty coverage if your engine or a part has failed due to abuse, neglect, improper maintenance or unapproved modifications.

You are responsible for presenting your engine to the nearest service dealer authorized by Wacker when a problem exists.

If you have any questions regarding your warranty rights and responsibilities, you should contact the WACKER CORPORATION Product Support Department (U.S.A. 1-800-770-0957, Canada 1-877-977-0775) for the information.

THINGS YOU SHOULD KNOW ABOUT THE EMISSION CONTROL SYSTEM WARRANTY:

MAINTENANCE AND REPAIRS

You are responsible for the proper maintenance of the engine. You should keep all receipts and maintenance records covering the performance of regular maintenance in the event questions arise. These receipts and maintenance records should be transferred to each subsequent owner of the engine. Wacker reserves the right to deny warranty coverage if the engine has not been properly maintained. Warranty claims will not be denied, however, solely because of the lack of required maintenance or failure to keep maintenance records.

MAINTENANCE, REPLACEMENT OR REPAIR OF EMISSION CONTROL DEVICES AND SYSTEMS MAY BE PERFORMED BY ANY REPAIR ESTABLISHMENT OR INDIVIDUAL; HOWEVER, WARRANTY REPAIRS MUST BE PERFORMED BY A SERVICE DEALER AUTHORIZED BY WACKER. THE USE OF PARTS THAT ARE NOT EQUIVALENT IN PERFORMANCE AND DURABILITY TO AUTHORIZED PARTS MAY IMPAIR THE EFFECTIVENESS OF THE EMISSION CONTROL SYSTEM AND MAY HAVE A BEARING ON THE OUTCOME OF A WARRANTY CLAIM.

If other than the parts authorized by Wacker are used for maintenance replacements or for the repair of components affecting emission control, you should assure yourself that such parts are warranted by their manufacturer to be equivalent to the parts authorized by Wacker in their performance and durability.

HOW TO MAKE A CLAIM

All repair qualifying under this limited warranty must be performed by a service dealer authorized by Wacker. In the event that any emission-related part is found to be defective during the warranty period, you shall notify WACKER CORPORATION Product Support Department (U.S.A. 1-800-770-0957, Canada 1-877-977-0775) and you will be advised of the appropriate warranty service dealer or service providers where the warranty repair can be performed.

CALIFORNIA EMISSION CONTROL WARRANTY STATEMENT

YOUR WARRANTY RIGHTS AND OBLIGATIONS

The California Air Resources Board and Wacker Corporation (herein “Wacker”) are pleased to explain the emissions control system warranty on your small off-road engine. In California, new small off-road engines must be designed, built and equipped to meet the State's stringent anti-smog standards. Wacker Corporation must warrant the emissions control system on your engine for the periods of time listed below provided there has been no abuse, neglect or improper maintenance of your engine.

Your emission control system may include parts such as the carburetor or fuel-injection system, fuel lines and the ignition system. Also included may be hoses, clamps, connectors and other associated components.

Where a warrantable condition exists, a Wacker authorized service center will repair your Wacker engine at no cost to you including diagnosis, parts and labor.

MANUFACTURER'S WARRANTY COVERAGE:

The emissions control system is warranted for two years. If any emissions-related part on your engine is defective, the part will be repaired or replaced by Wacker.

OWNER'S WARRANTY RESPONSIBILITIES:

As the Wacker engine owner, you are responsible for the performance of the required maintenance listed in your owner's manual. Wacker recommends that you retain all receipts covering maintenance on your Wacker engine, but Wacker cannot deny warranty solely for the lack of receipts.

As the Wacker engine owner, you should however be aware that Wacker may deny you warranty coverage if your Wacker engine or a part has failed due to abuse, neglect, improper maintenance or unapproved modifications.

You are responsible for presenting your Wacker engine to a Wacker dealer or service center as soon as a problem exists. The warranty repairs should be completed in a reasonable amount of time, not to exceed 30 days.

If you have any questions regarding your warranty rights and responsibilities, you should contact your local Wacker equipment dealer, service center or the WACKER CORPORATION Product Support Department (U.S.A. 1-800-770-0957, Canada 1-877-977-0775) for the information.

GENERAL EMISSIONS WARRANTY COVERAGE

- California Only -

Wacker warrants to the ultimate purchaser and each subsequent purchaser that this small off-road engine (1) has been designed, built and equipped so as to conform with all applicable regulations; and (2) is free from defects in materials and workmanship that cause the failure of a warranted part to conform with those regulations as may be applicable to the terms and conditions stated below.

A. The warranty period begins on the date the engine is delivered to an ultimate purchaser or first placed into service. The warranty period is two years.

B. Subject to certain conditions and exclusions as stated below, the warranty on emissions related parts is as follows:

1) Any warranted part that is not scheduled for replacement as required maintenance in your owner's manual is warranted for the warranty period stated above. If the part fails during the period of warranty coverage, the part will be repaired or replaced by Wacker according to subsection (4) below. Any such part repaired or replaced under warranty will be warranted for the remainder of the period.

2) Any warranted part that is scheduled only for regular inspection in your owner's manual is warranted for the warranty period stated above. Any such part repaired or replaced under warranty will be warranted for the remaining warranty period.

3) Any warranted part that is scheduled for replacement as required maintenance in your owner's manual is warranted for the period of time before the first scheduled replacement date for that part. If the part fails before the first scheduled replacement, that part will be repaired or replaced by Wacker according to subsection (4) below. Any such part repaired or replaced under warranty will be warranted for the remainder of the period prior to the first scheduled replacement point for the part.

4) Repair or replacement of any warranted part under the warranty provisions herein must be performed at a warranty station at no charge to the owner.

5) Notwithstanding the provisions herein, warranty services or repair will be provided at all of our distribution centers that are franchised to service the subject engines.

6) The owner must not be charged for diagnostic labor that leads to the determination that a warranted part is in fact defective, provided that such diagnostic work is performed at a warranty station.

7) Wacker is liable for damages to other engine components proximately caused by a failure under warranty of any warranted part.

8) Throughout the engine warranty period stated above, Wacker will maintain a supply of warranted parts sufficient to meet the expected demand for such parts.

9) Any replacement part may be used in the performance of any warranty maintenance or repairs and must be provided without charge to the owner. Such use will not reduce the warranty obligations of Wacker.

10) Add-on or modified parts that are not exempted by the Air Resources Board may not be used. The use of any non-exempted add-on or modified parts by the ultimate purchaser will be grounds for disallowing a warranty claim. Wacker will not be liable to warrant failures of warranted parts caused by the use of a non-exempted add-on or a modified part.

C. Warranted Parts:

The repair or replacement of any warranted part otherwise eligible for warranty coverage may be excluded from such warranty coverage if Wacker demonstrates that the engine has been abused, neglected, or improperly maintained, and that such abuse, neglect, or improper maintenance was the direct cause of the need for repair or replacement of the part. That notwithstanding, any adjustment of a component that has a factory installed, and properly operating, adjustment limiting device is still eligible for warranty coverage. The following emissions warranty parts list are covered.

1) Fuel Metering System
   - i) Carburetor and internal parts (and/or pressure regulator or fuel injection system).
   - ii) Air/fuel ratio feedback and control system, if applicable.
   - iii) Cold start enrichment system, if applicable.
   - iv) Regulator assembly (gaseous fuel, if applicable)
2) Air Induction System
   - i) Intake manifold, if applicable.
   - ii) Air filter
3) Ignition System
   - i) Spark plugs
   - ii) Magneto or electronic ignition system
   - iii) Spark advance/retard system, if applicable
4) Exhaust manifold, if applicable
5) Evaporation System
   - i) Fuel line
   - ii) Fuel line fittings

3. Safety Information

This manual contains DANGER, WARNING, CAUTION, and NOTE callouts which must be followed to reduce the possibility of personal injury, damage to the equipment, or improper service.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

DANGER

DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

CAUTION: Used without the safety alert symbol, CAUTION indicates a potentially hazardous situation which, if not avoided, may result in property damage.

Note: *Contains additional information important to a procedure*.

3.1 Laws Pertaining to Spark Arresters

Notice: State Health Safety Codes and Public Resources Codes specify that in certain locations spark arresters be used on internal combustion engines that use hydrocarbon fuels. A spark arrester is a device designed to prevent accidental discharge of sparks or flames from the engine exhaust. Spark arresters are qualified and rated by the United States Forest Service for this purpose.

In order to comply with local laws regarding spark arresters, consult the engine distributor or the local Health and Safety Administrator.

3.2 Operating Safety

DANGER

Internal combustion engines present special hazards during operation and fueling. Read and follow the warning instructions in the engine owner's manual and the safety guidelines below. Failure to follow the warnings and safety guidelines could result in severe injury or death.

3.2.1 NEVER allow anyone to operate this equipment without proper training. People operating this equipment must be familiar with the risks and hazards associated with it.

3.2.2 NEVER touch the engine or muffler while the engine is on or immediately after it has been turned off. These areas get hot and may cause burns.

3.2.3 NEVER use accessories or attachments that are not recommended by Wacker. Damage to equipment and injury to the user may result.

3.2.4 NEVER pump volatile, flammable or low flash point fluids. These fluids could ignite or explode.

3.2.5 NEVER pump corrosive chemicals or water containing toxic substances. These fluids could create serious health and environmental hazards. Contact local authorities for assistance.

3.2.6 ALWAYS read, understand, and follow procedures in the Operator's Manual before attempting to operate the equipment.

3.2.7 ALWAYS be sure operator is familiar with proper safety precautions and operation techniques before using machine.

3.2.8 ALWAYS be sure the machine is on a firm, level surface and will not tip, roll, slide, or fall while operating.

3.2.9 ALWAYS close fuel valve on engines equipped with one when machine is not being operated.

3.2.10 ALWAYS store the equipment properly when it is not being used. Equipment should be stored in a clean, dry location out of the reach of children.

3.3 Operator Safety while using Internal Combustion Engines

WARNING

Poorly maintained equipment can become a safety hazard! In order for the equipment to operate safely and properly over a long period of time, periodic maintenance and occasional repairs are necessary.

3.3.1 DO NOT smoke while operating the machine.

3.3.2 DO NOT smoke when refueling the engine.

3.3.3 DO NOT refuel a hot or running engine.

3.3.4 DO NOT refuel the engine near an open flame.

3.3.5 DO NOT spill fuel when refueling the engine.

3.3.6 DO NOT run the engine near open flames.

3.3.7 ALWAYS refill the fuel tank in a well-ventilated area.

3.3.8 ALWAYS replace the fuel tank cap after refueling.

3.4 Service Safety

WARNING

Poorly maintained equipment can become a safety hazard! In order for the equipment to operate safely and properly over a long period of time, periodic maintenance and occasional repairs are necessary.

3.4.1 DO NOT attempt to clean or service the machine while it is running. Rotating parts can cause severe injury.

3.4.2 DO NOT crank a flooded engine with the spark plug removed on gasoline-powered engines. Fuel trapped in the cylinder will squirt out the spark plug opening.

3.4.3 DO NOT test for spark on gasoline-powered engines if the engine is flooded or the smell of gasoline is present. A stray spark could ignite the fumes.

3.4.4 DO NOT use gasoline or other types of fuels or flammable solvents to clean parts, especially in enclosed areas. Fumes from fuels and solvents can become explosive.

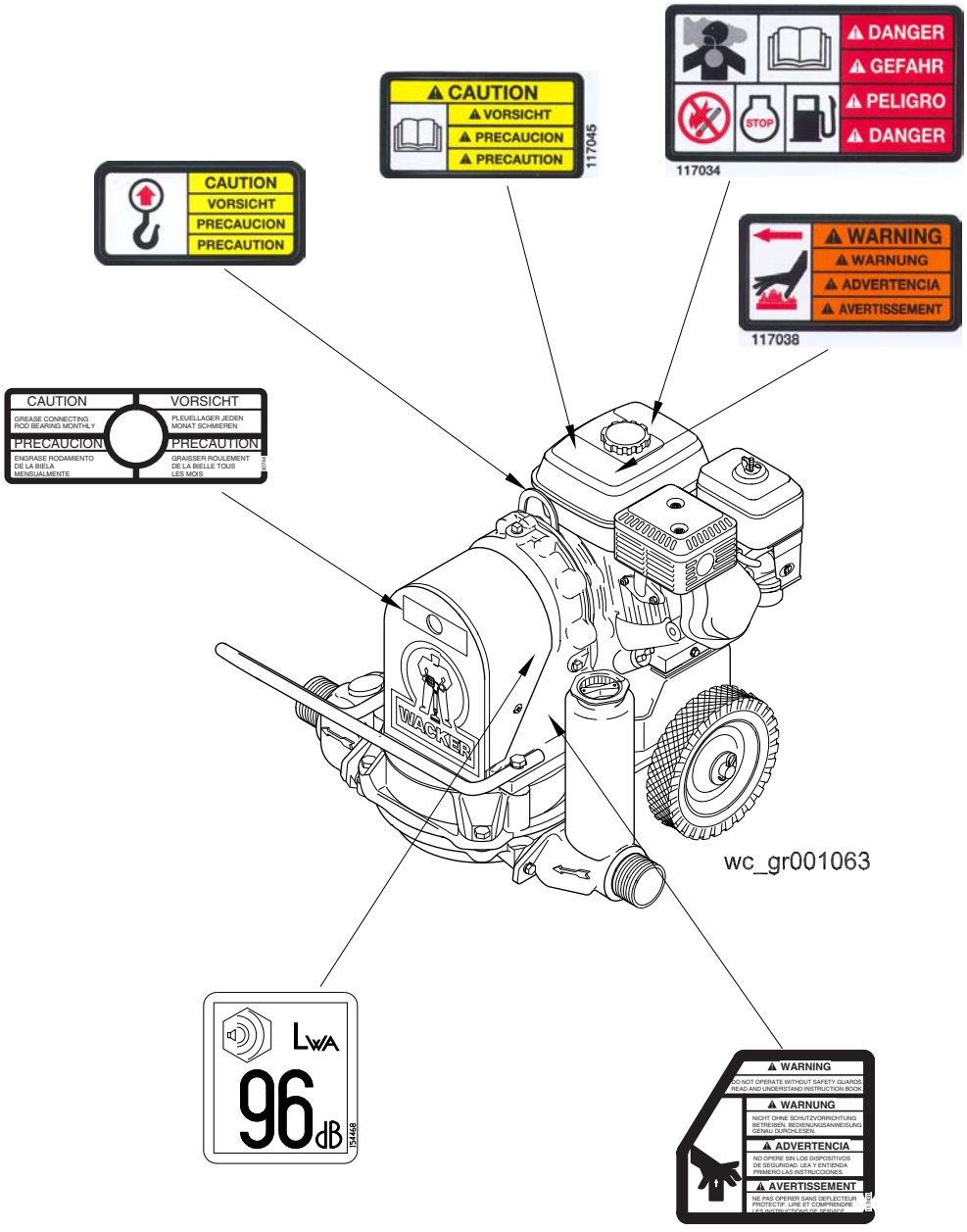
3.4.5 ALWAYS operate the machine with all safety devices and guards in place and in working order.

3.4.6 ALWAYS keep the area around the muffler free of debris such as leaves, paper, cartons, etc. A hot muffler could ignite the debris and start a fire.

3.4.7 ALWAYS replace worn or damaged components with spare parts designed and recommended by Wacker Corporation.

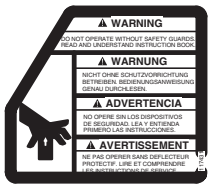
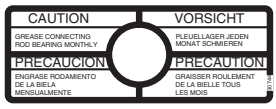
3.4.8 ALWAYS disconnect the spark plug on machines equipped with gasoline engines, before servicing, to avoid accidental start-up.

3.5 Label Locations



3.6 Safety Labels

Wacker machines use international pictorial labels where needed. These labels are described below:

Label	Meaning
	DANGER! Engines emit carbon monoxide; operate only in well-ventilated area. Read the Operator's Manual. No sparks, flames, or burning objects near the machine. Shut off the engine before refueling.
	WARNING! Hot surface!
	CAUTION! Read and understand the supplied Operator's Manuals before operating this machine. Failure to do so increases the risk of injury to yourself or others.
	WARNING! Pinch point! Do not operate without safety guards. Read and understand the operator's manual.
	CAUTION! Grease connecting rod bearing monthly.

Label	Meaning
	CAUTION! Lifting point
	Guaranteed sound power level in dB(A)

4. Technical Data

4.1 Engine

Item Number:		PDI/PDT 2 0009489, 0009494	PDI/PDT 3 0009491, 0009492, 0009495
Engine			
Engine Make		Wacker	
Engine Model		WM 130	
Displacement	cm^3 (in^3)	126 (7.7)	
Engine Speed	rpm	2800	
Max. Operating Power	kW (Hp)	3.2 (4.3)	
Spark Plug	type	NGK BR6HS (Champion RL86C)	
Electrode Gap	mm (in.)	0.6–0.7 (0.024–0.028)	
Air Cleaner	type	Dual element	
Engine Lubrication	oil grade	SAE10W30 - SE or higher	
Engine Oil Capacity	ml (oz.)	600 (20)	
Fuel	type	Regular unleaded gasoline	
Fuel Tank Capacity	l (qts.)	2.7 (2.9)	
Fuel Consumption	l (qts.)/hr.	1.1 (1.2)	
Running Time	hr.	2.5	

4.2 Pump

Item Number:		PDI/PDT 2 0009489, 0009494	PDI/PDT 3 0009491, 0009492, 0009495
Pump			
Dimensions (L x W x H)	mm (in.)	1010 x 630 x 570 (40 x 25 x 22.5)	1010 x 745 x 605 (40 x 29.3 x 24)
Operating Weight	kg (lbs.)	52 (114)	61 (133)
*Max. Suction Lift	m (ft.)	7.5 (25)	
Max. Discharge Head	m (ft.)	7.5 (25)	
Max. Flow Rate	l/m (gpm)	189 (50)	333 (88)
Gear Case Lubrication	oil grade ml (oz.)	SAE 80W-90 532 (18)	
Suction / Discharge Dia.	mm (in.)	50 (2)	75 (3)
Maximum Solid Size	mm (in.)	32 (1.25)	45 (1.75)

* Based on pump operating at sea level. Maximum suction lift will be less at higher altitudes.

4.3 Sound Measurements

The required sound specification, Paragraph 1.7.4.f of 89/392/EEC Machinery Directive, is:

- the guaranteed sound power level (L_{WA}) = 96 dB(A).
- the sound pressure level at operator's location (L_{pA}):

  PDT 2 = 78.8, PDT 3 = 82.

  These sound values were determined according to ISO 3744 for the sound power level (L_{WA}) and ISO 6081 for the sound pressure level (L_{pA}) at the operator's location.

5. Operation

5.1 Application

This pump is intended for removing clean water or water containing a large amount of debris and suspended solids. The model PD 2 can pump water containing solids up to 30 mm (1.25 in.) diameter. The model PD 3 can pump water containing solids up to 45 mm (1.75 in.) in diameter.

Diaphragm pumps are ideal for pumping mud, slurries and seepage. Typical applications include dewatering of trenches, sewers, pipelines, septic tanks, holding tanks, farm ponds, fields and excavations where a large amount of solids may be present in the water.

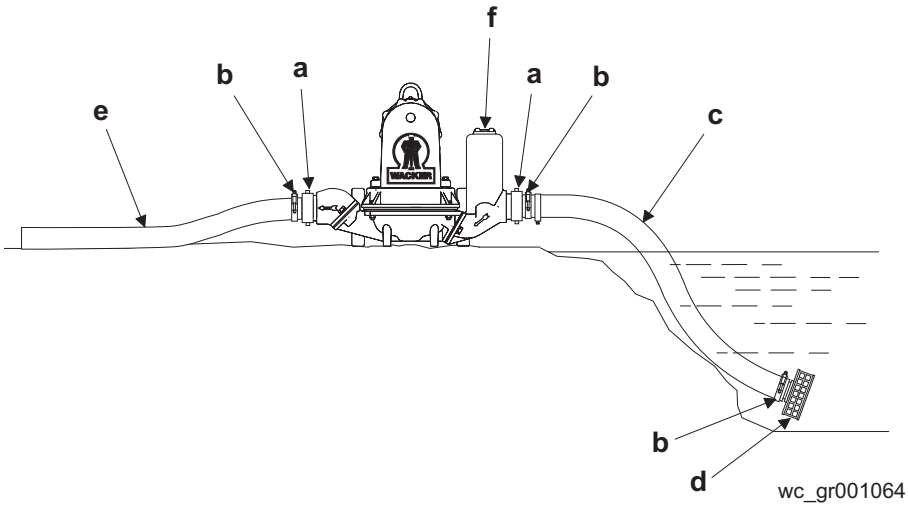
5.2 Recommended Fuel

The engine requires regular grade unleaded gasoline. Use only fresh, clean gasoline. Gasoline containing water or dirt will damage fuel system. Consult engine Owner's Manual for complete fuel specifications.

5.3 Priming Pump

See Graphic: wc_gr001064

Diaphragm pumps are self priming and seldom need to have water added to them before starting. However, if the pump has not been used for several weeks and the rubber valves inside it are dry, adding water through the surge chamber **(f)** will help the valves seal and shorten the amount of time required for the pump to prime.



5.4 Before Starting

See Graphic: wc_gr001064

5.4.1 Read safety instructions at the beginning of manual.

5.4.2 Place pump as near to water as possible, on a firm, flat, level surface.

5.4.3 Check that hoses are securely attached to pump. Suction hose **(c)** must not have any air leaks. Check that all hose clamps **(b)** and couplings **(a)** are tight. Check that cap on surge chamber **(f)** is tight.

5.4.4 Check that discharge hose **(e)** is not blocked. Lay hose out as straight as possible. Remove any twists or sharp bends from hose which may block the flow of water.

Note: *Operating the pump with any part of the discharge line positioned higher than 7.5 m (25 ft.) above the pump can cause backflow into the pump and damage pump components.*

5.4.5 Make sure suction strainer **(d)** is clean and securely attached to end of hose. The strainer is designed to protect the pump by preventing large objects from being pulled into the pump.

Position strainer so it will remain under water as water level drops.

5.4.6 Check fuel level, engine oil level, and condition of air cleaner.

5.5 To Start

See Graphic: wc_gr000655

5.5.1 Open fuel valve by moving lever down **(a1)**.

Note: *If engine is cold, move choke lever to close position* **(d2)**. *If engine is hot, set choke to open position* **(d1)**.

5.5.2 Turn engine switch to “ON” **(b2)**.

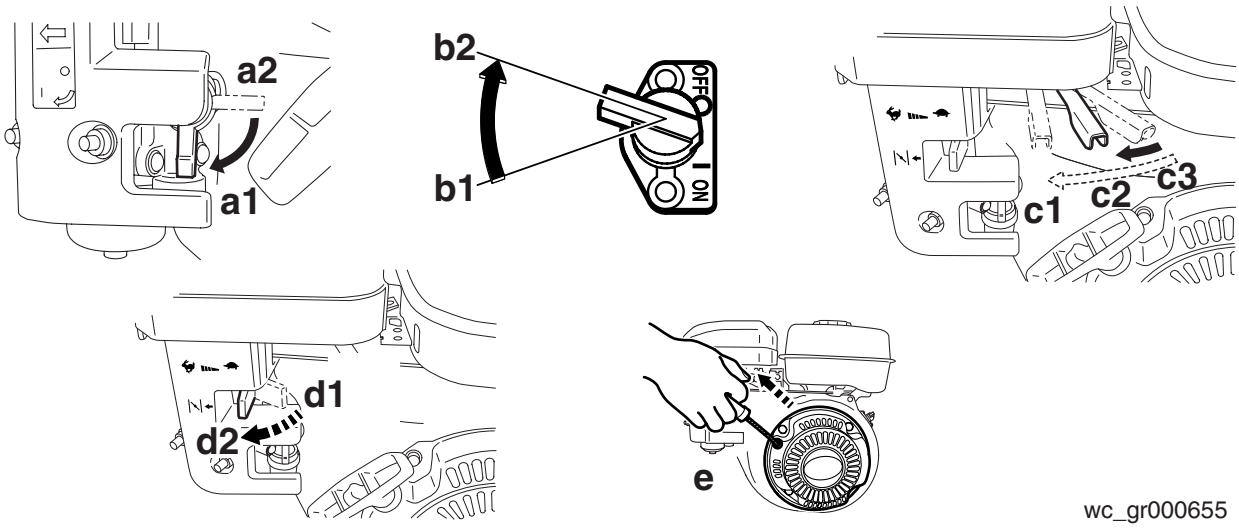
5.5.3 Open throttle by moving it slightly to left **(c2)**.

5.5.4 Pull starter rope **(e)**.

Note: *If the oil level in the engine is low, the engine will not start. If this happens, add oil to engine.*

5.5.5 Open choke as engine warms **(d1)**.

5.5.6 Open throttle fully to operate **(c1)**.



wc_gr000655

5.6 To Stop

See Graphic: wc_gr000655

5.6.1 Reduce engine RPM to idle by moving throttle completely to right **(c3)**.

5.6.2 Turn engine switch to “OFF” **(b1)**.

5.6.3 Close fuel valve **(a2)**.

5.7 Operation

Run engine at full speed while operating pump.

Pump should begin pumping water within a minute depending on length of suction hose and height of pump above water. Longer hoses will require more time.

If pump does not prime, check for loose fittings or air leak in suction hose. Make sure strainer in water is not blocked.

WARNING

DO NOT pump flammable fluids, fuels, corrosive chemicals or fluids containing toxic substances. These fluids can create potentially dangerous health and environmental hazards. Contact local authorities for assistance.

5.8 Accessories

WACKER offers a complete line of fittings, hoses, and clamps to properly connect the pump to match various job conditions.

5.9 Hoses and Clamps

See Graphic: wc_gr001065

Suction Hose

Suction hoses **(a)** must be rigid enough not to collapse when pump is operating.

Discharge Hose

Discharge hoses **(b)** are usually thin-walled collapsible hoses. Rigid hoses similar to those used as suction hoses may also be used as discharge hoses.

Note: *Suction and discharge hoses are available from WACKER. Contact your nearest dealer for more information.*

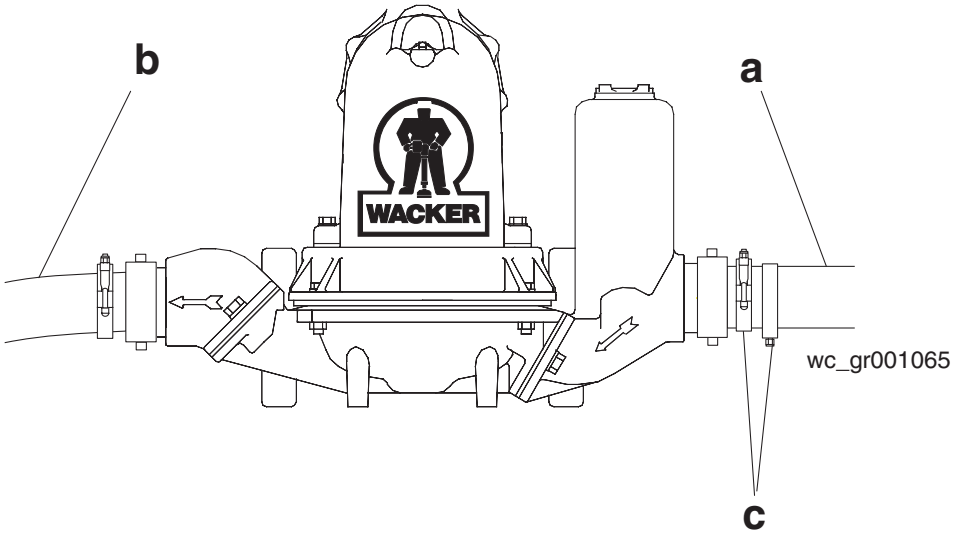
Suction Hose to Inlet Coupling

Two clamps **(c)** are recommended for connection of suction hoses to inlet coupling.

Note: *This connection is important. Even a small air leak on the suction side of pump will prevent the pump from priming.*

Other Hose Connections

For other hose connections, one T-bolt or worm-gear type clamp is usually sufficient to hold hoses in place. In some cases, slight variances in hose diameters may make it necessary to add more clamps in order to maintain tight connections.



6. Maintenance

6.1 Periodic Maintenance Schedule

The chart below lists basic machine and engine maintenance. Refer to the engine manufacturer's Operator's Manual for additional information on engine maintenance.

	Daily before starting	After first 20 hrs.	Every 2 weeks or 25 hrs.	Every 100 hrs.	Every 300 hrs.
Check fuel level.	■				
Check engine oil level.	■				
Inspect air filter. Replace as needed.	■				
Check external hardware.	■				
Change engine oil.		■		■	
Check oil level in pump gear case.			■		
Grease pump connecting rod bearing.			■		
Clean sediment cup on engine fuel system.				■	
Check and clean spark plug.				■	
Check and adjust valve clearance.					■
Change oil in pump gear case.					■

6.2 Changing Engine Oil

See Graphic: wc_gr000087

6.2.1 Drain oil while engine is still warm.

Note: *In the interests of environmental protection, place a plastic sheet and a container under the machine to collect any liquid which drains off. Dispose of this liquid in accordance with environmental protection legislation*.

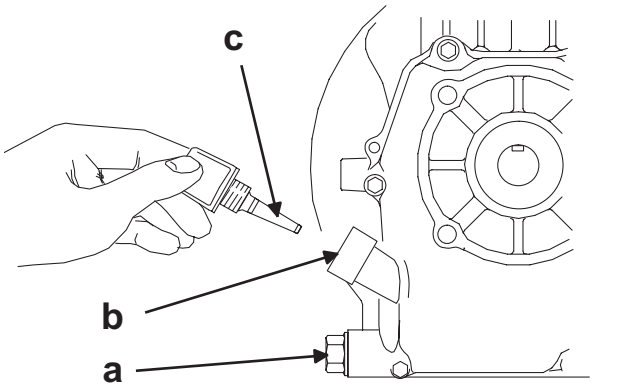
6.2.2 Remove the oil drain plug **(a)**.

6.2.3 Allow the oil to drain.

6.2.4 Install the drain plug.

6.2.5 Fill the engine crankcase through the oil filler opening **(b)**, to the upper mark on the dipstick **(c)**. Do not thread in the dipstick to check the level. *See Technical Data* for oil quantity and type.

6.2.6 When the crankcase is full, reinstall the dipstick.



wc_gr000087

6.3 Cleaning Fuel Strainer

See Graphic: wc_gr001093

6.3.1 To remove water and dirt, close the fuel lever and remove the fuel strainer.

6.3.2 Inspect the fuel strainer **(a)** for water and dirt.

6.3.3 After removing any dirt and water, wash the fuel cup with a nonflammable solvent.

6.3.4 Reinstall securely to prevent leakage.

6.4 Servicing Air Cleaner

See Graphic: wc_gr000656

WARNING

NEVER use gasoline or other types of low flash point solvents for cleaning the air cleaner. A fire or explosion could result.

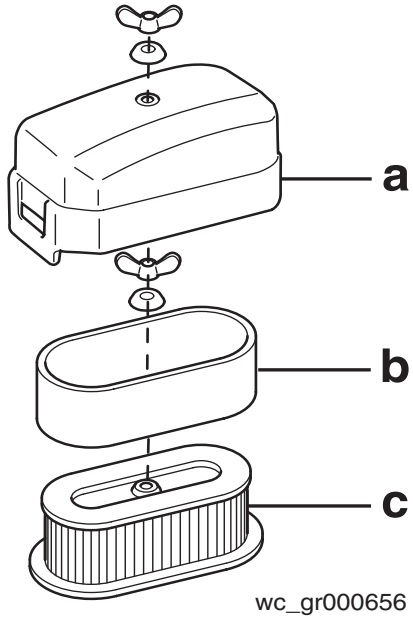
CAUTION: NEVER run engine without air cleaner. Severe engine damage will occur.

The engine is equipped with a dual element air cleaner. Under normal operating conditions, elements should be cleaned once every week. Under severe, dry and dusty conditions, the elements should be maintained daily. Replace an element when saturated with dirt that cannot be removed.

6.4.1 Remove the air cleaner cover **(a)**. Remove the filter assembly by pulling it straight up. Inspect both elements for holes or tears. Replace damaged elements.

6.4.2 Wash the foam element **(b)** in a solution of mild detergent and warm water. Rinse it thoroughly in clean water. Allow the element to dry thoroughly.

6.4.3 Tap the paper element **(c)** lightly to remove excess dirt or blow compressed air through the filter from the inside out. Replace the paper element if it appears heavily soiled.



wc_gr000656

6.5 Spark Plug

See Graphic: wc_gr000028

Clean or replace spark plug as needed to ensure proper operation.

WARNING

The muffler becomes very hot during operation and remains hot for a while after stopping the engine. Do not touch the muffler while it is hot.

Note: *Refer to the Technical Data for the recommended spark plug type and the electrode gap setting.*

6.5.1 Remove spark plug and inspect it.

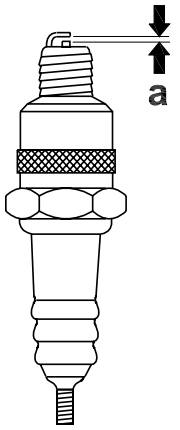
6.5.2 Replace plug if the insulator is cracked or chipped.

6.5.3 Clean spark plug electrodes with a wire brush.

6.5.4 Set the electrode gap **(a)**.

6.5.5 Tighten spark plug securely.

CAUTION: A loose spark plug can become very hot and may cause engine damage.



wc_gr000028

6.6 Gear Case

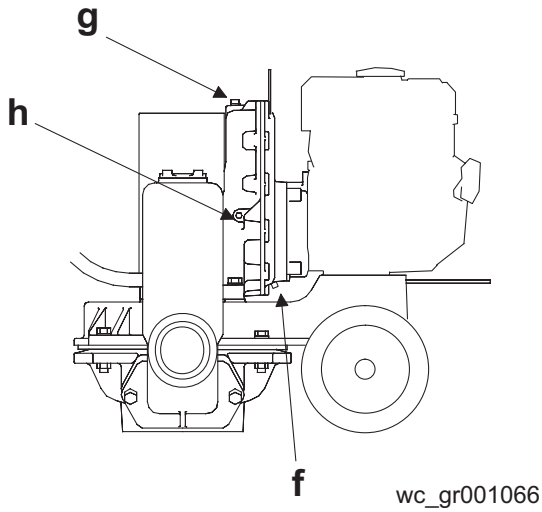
See Graphic: wc_gr001066

Check the oil level in the gear case once a week or every 25 hours of operation.

Remove oil level plug **(h)**. Check that oil level is even with plug opening. If oil level is low, add oil through the top fill plug opening **(g)**. Do not overfill.

Change oil in gear case once a year or every 300 hours of operation.

Drain oil through drain plug opening **(f)** at bottom of gear case. Add oil through fill plug on top of gear case. See *Technical Data* for oil quantity and type.



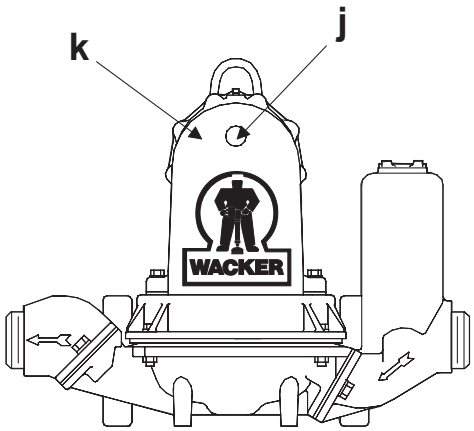
wc_gr001066

6.7 Connecting Rod Bearing

See Graphic: wc_gr001067

Grease connecting rod bearing once a week or every 25 hours of operation.

Use a hand operated grease gun. Add grease through grease fitting located behind access hole **(j)** provided on front cover.



wc_gr001067

6.8 Cleaning Pump

See Graphic: wc_gr001067

When pumping heavy sludges or water containing large amounts of dirt and solids, clean the pump often. If allowed to sit in the pump and dry, these materials will harden and could damage the valves or diaphragm inside the pump the next time it is used.

When cleaning pump:

6.8.1 Pump clean water through pump for a few minutes after each use to flush dirt from inside pump and hoses.

6.8.2 Remove dirt from between engine cooling fins to prevent them from clogging up. This will prevent engine from overheating.

6.8.3 Remove front cover **(k)** and clean dirt and grease build-up from connecting rod and inside of front pump cover.

6.9 Storage

If pump is being stored for more than 30 days:

WARNING

NEVER open priming plug, discharge plug, or cover when pump is hot.

6.9.1 Remove discharge plug from pump casing and drain out any water left in the housing after pump has cooled.

6.9.2 Remove pump cover and clean inside of pump housing. Coat inside of pump with a light film of oil to reduce corrosion. A spray can of oil works well for this.

6.9.3 Tape up suction and discharge ports to prevent anything from falling into pump.

6.9.4 Change engine oil and follow procedures described in engine manual for engine storage.

6.9.5 Cover pump and engine and store in a clean, dry area.

6.10 Troubleshooting

Problem / Symptom	Reason / Remedy
Engine does not start.	• Engine problem. See engine manufacturer's service manual for troubleshooting and repair. • Engine oil level too low. Add oil to engine. • Pump housing filled with dirt and debris. Disassemble and clean inside of pump. • Pump gear case damaged. Inspect and repair.
Engine starts but pump does not take in water.	• Pump is located too high above or too far away from water. Locate pump closer to water. • Air leak on suction side of pump. Check that hose fittings and cap on surge chamber are tight and sealing properly. • Suction hose damaged or collapsed. Repair or replace hose. • Strainer plugged. Clean or replace strainer. • Dirt collecting inside pump and hoses, blocking flow. Clean inside of pump and flush hoses. • Engine running slow. Check engine speed and adjust. See chapter *Technical Data* for engine speed. • Pump valves damaged or not seating properly. Check for stones and gravel imbedded in valves. Replace valves. • Diaphragm loose or damaged. Inspect diaphragm for damage. Replace and tighten.
Pump output low.	• Pump located too high above or too far away from water. Locate pump closer to water. • Suction strainer or intake line partially plugged. Clean hose line and strainer. • Discharge hose is kinked or end is blocked. Check that hose lies straight and flows freely. • Discharge hose too narrow. Use hose of equal diameter or larger than suction hose.

Notes:

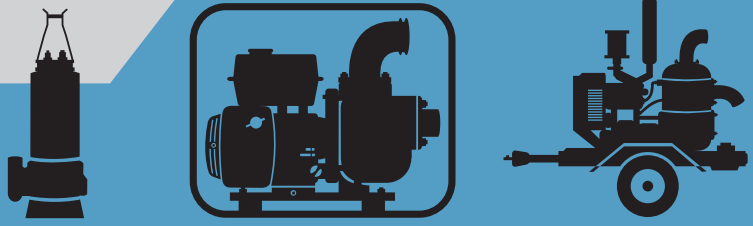
PORTABLE PUMPS

www.aem.org

ASSOCIATION OF AEM EQUIPMENT MANUFACTURERS

SAFETY MANUAL

FOR OPERATING AND MAINTENANCE PERSONNEL



SAFETY ALERT SYMBOL

This Safety Alert Symbol means ATTENTION is involved!

The Safety Alert Symbol identifies important safety messages on machines, safety signs, in manuals, or elsewhere. When you see this symbol, be alert to the possibility of personal injury or death. Follow the instructions in the safety message.

Why is SAFETY important to YOU?

3 BIG REASONS

- **Accidents KILL or DISABLE**
- **Accidents COST**
- **Accidents CAN BE AVOIDED**

REFERENCES

The following is a partial list of referenced material on safe operating practices:

U.S. Department of Labor publishes safety and health regulations and standards under the authority of the Occupational Safety and Health Act for the general construction and mining industries.
U.S. Department of Labor
Washington, DC 20210

NFPA — National Fire Protection Association
P.O. Box 9101
1 Battery March Park
Quincy, MA 02269-9101

SAE — Society of Automotive Engineers, Inc.
400 Commonwealth Drive
Warrendale, PA 15096
Publishes a list, "Operator Precautions" SAE J153 MAY 87.

AEM — Association of Equipment Manufacturers
111 East Wisconsin Avenue
Milwaukee, WI 53202

CONTENTS

FOREWORD

This safety manual is intended to point out some of the basic situations which may be encountered during the normal operation and maintenance of your equipment, and to suggest possible ways of dealing with these conditions.

Additional precautions may be necessary, depending on application, pump type, configuration and attachments used, conditions at the work-site or in the maintenance area. The manufacturer has no direct control over pump application, operation, inspection, lubrication or maintenance. Therefore, it is your responsibility to use good, safe, practices in these areas.

The information provided in this manual supplements the specific information about your pump that is contained in the manufacturer's manual(s). Other information which may affect the safe operation of your pump may be contained on safety signs, decals, markings, insurance requirements, employer's safety programs, safety codes, local, state/provincial and federal laws, rules and regulations, contracts, agreements and warranties.

It is your responsibility to read and understand this safety manual and the manufacturer's manual(s) before operating your pump. This safety manual takes you step-by-step through your working day. If you do not understand any of this information, or if errors or contradictions seem to exist, consult with your supervisor before operating your pump.

IMPORTANT: If you do not have the manufacturer's manual(s) for your particular pump, get a replacement manual from your employer, equipment dealer, or manufacturer of your pump. Keep this safety manual and the manufacturer's manual(s) with your pump.

Unauthorized modifications of pumps create hazards. Pumps must not be modified or altered unless prior approval is obtained from the manufacturer.

DO NOT PUMP VOLATILE/FLAMMABLE OR CAUSTIC/CORROSIVE LIQUIDS.

REFER TO THE OWNER'S MANUAL OR CONSULT WITH THE MANUFACTURER FOR THE PROPER PUMP MATERIALS IF YOU ARE TO PUMP HAZARDOUS CAUSTIC/CORROSIVE LIQUIDS.

KNOW THE RULES

Every employer is concerned about safety. Safe operation and proper maintenance of your pump can prevent accidents. KNOW the rules — LIVE by them. (FIG. 1)

When starting work at a new site, check with the designated safety coordinator for specific safety instructions. DON'T LEARN SAFETY THE HARD WAY.

Know the meaning of all hand signals, signal flags, signs and markings.

Know the traffic rules used at the work site. Know who the signal man is; watch and obey his signals.

Know where the fire extinguishers and first aid kits are kept and how to use them. Know where to get proper aid and assistance when needed.

Use common sense to avoid accidents. If an accident does occur, be prepared to react to it quickly and effectively.

NEVER PANIC.

Remember that **YOU are the key to safety**. Good safety practices not only protect you but also protect the people around you. Study this manual and the manufacturer's manual(s) for your specific pump. Make them a working part of your safety program. Keep in mind that this safety manual is written for only this type of equipment. Practice all other usual and customary safe working precautions, and above all (FIG. 1).

REMEMBER — SAFETY IS UP TO YOU

YOU CAN PREVENT SERIOUS INJURY OR DEATH

FIG. 1

FOLLOW A SAFETY PROGRAM

KNOW WHAT IT IS?

Consult your supervisor for specific instructions and personal safety equipment required.

For instance, you may need:

- Hard Hat
- Safety Shoes
- Eye Protection
- Respirators
- Heavy Gloves
- Reflector Vests
- Hearing Protection
- Face Protection
- Back Supports
- Other job related specific items

Do not wear loose clothing or any accessory — flopping cuffs, untied shoe-laces, dangling neckties and scarves, rings, wrist watches, or other jewelry — that can catch on protruding or moving parts or controls. Long hair should be securely bound to prevent entanglement with moving parts. (FIG. 3)

FIG. 2

FIG. 3

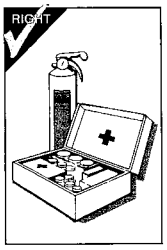


FIG. 4

BE ALERT!

Know where to get assistance. Know how to use a first aid kit and fire extinguisher or fire suppression system. (FIG. 4)

BE AWARE!

Take advantage of training programs offered.

Safety programs should require that one person at each jobsite be assigned the overall responsibility and authority for safety. Know who the person is, and COMMUNICATE with them.

Know what the jobsite rules are, and FOLLOW THE RULES. Be safety conscious, responsible and reliable. Think about safety BEFORE something happens.

BE CAREFUL!

Human error is caused by many factors: carelessness, fatigue, overload, preoccupation, incompatibility between operator and the equipment, drugs, and alcohol to name a few. Damage to the equipment can be fixed in a short period of time, but injury, or death has a lasting effect.

For your safety and safety of others, encourage your fellow workers to act within safety rules.

CLOTHING AND PERSONAL PROTECTIVE ITEMS

ALWAYS wear appropriate safety glasses, goggles or face shield when working. (FIG. 2) Proper eye protection can keep flying particles from grinding, drilling or hammering operations, or fluids such as fuel, solvents, lubricants and brake fluids from damaging your eyes. Normal glasses do NOT provide adequate protection.

ALWAYS wear a hard hat and safety shoes. (FIG. 2) ALWAYS wear hearing protectors when exposed to high noise levels for extended periods. ALWAYS wear a respirator when painting or exposed to dusty conditions. ALWAYS keep your pockets free of loose objects which can fall out and drop into machinery. (FIG. 5) Heavy gloves should be worn for many operations.

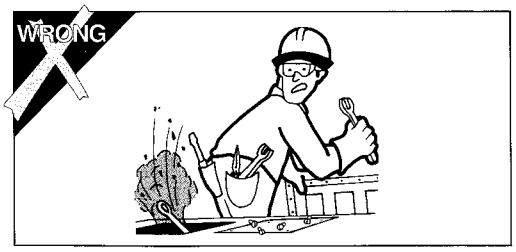


FIG. 5

EXHAUST FUMES

Engine exhaust fumes can cause sickness or death. If it is necessary to run an engine in an enclosed area, remove the exhaust fumes from the area with an exhaust pipe extension. If you do not have an exhaust pipe extension, be positive the area is adequately ventilated. (FIG. 6)

FIG. 6

HEAVY PARTS

Handle tools and heavy parts sensibly — with regard for yourself and other persons. Lower items — don't throw or drop them.

ALWAYS use proper hoisting equipment for lifting heavy loads.

ALWAYS use a back brace when lifting by hand.

FIRE PREVENTION

Whenever possible use a nonflammable solvent to clean parts. Do not use gasoline or other fluids that give off harmful vapors.

If flammable fluids, such as gasoline or diesel fuel, must be used, extinguish open flames or sparks and DO NOT smoke.

Store dangerous fluids in a suitable place, in approved containers which are clearly marked. NEVER smoke in areas where flammable fluids are used or stored. (FIG. 7)

Use proper nonflammable cleaning solvents. Follow solvent manufacturer's instructions for use.

Always remove all flammable material in the vicinity of welding and/or burning operations.

ALWAYS keep the floor in the work area clean and dry. Oily, greasy floors can easily lead to falls. Wet spots, especially near electrical equipment, can be hazardous. (FIG. 7)

Know where fire extinguishers are kept — how they operate — and for what type of fire they are intended.

Check readiness of any fire detectors and fire suppression systems.

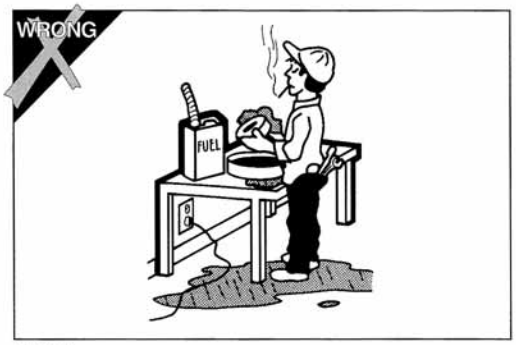


FIG. 7

LEARN TO BE SAFE

NEVER operate a pump which is new to you without first being instructed in it's proper operation. READ the operator's manual. If one has not been provided, GET ONE AND STUDY IT BEFORE OPERATING THE PUMP.

Know the meaning of all identification symbols on your controls and gauges. (FIG. 8)

Know the location of the emergency shut-down control if the machine is so equipped.

Before attempting to operate the pump, know the capabilities and limitations of the pump. Familiarize yourself with controls and instruments — their locations and functions.

Keep hands, levers and knobs clean of oil or grease to prevent slipping.

Carefully read and follow the instructions on all safety signs and decals on the pump. Keep safety signs in good condition. Replace missing or damaged safety signs.

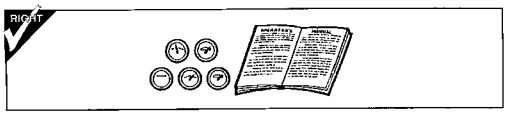


FIG. 8

CHECK IT OUT!

Know what safety devices your machine is equipped with ... and see that each item is securely in place and in operating condition. (FIG. 9)

For example:

- Drawbar Coupling Chains and Pins
- Alarms and Warning Lamps
- Reflectors
- Guards and Shields
- Drain Covers, Plugs, and Caps
- Shut-Down Devices
- Leveling Jacks
- Pressure Relief Devices
- Lifting Devices

FIG. 9

NEVER START OR OPERATE A PUMP KNOWN OR SUSPECTED TO BE DEFECTIVE OR MALFUNCTIONING.

If your daily check uncovers any items that need attention — repair, replacement, or adjustment — report them promptly. The most minor malfunction could be the result of more serious trouble — or can cause it, if pump is operated. When in doubt, attach an OSHA Lockout/Tagout device tag to the control panel to disconnected electrical power supply at breaker, on electrically driven pumps and disconnect the battery and/or spark plug wire on engine driven pumps.

WORK SAFELY — Pumps In General

SAFE WORKING PROCEDURES

USE COMMON SENSE! Most accidents can be avoided by using common sense and concentrating on the job to be done.

ONLY EXPERIENCED AND QUALIFIED personnel should install and operate pump equipment.

KNOW THE PROPER starting procedure for your equipment. Follow the manufacturer's operation manual ... to the letter.

DO NOT operate a pump without all guards and shields in place. (If OSHA required guards are damaged or misplaced, contact the manufacturer for a replacement.)

When **lifting pump** use only lifting equipment in good repair and with adequate capacity. Follow manufacturer's lifting recommendation.

Check all lubricant levels before pump installation in accordance with manufacturer's maintenance programs.

Keep hands and feet clear of moving parts. DO NOT stick fingers into a pump when in operation. Check suction strainer and hose regularly for proper submergence and to be sure it is free of obstructions.

NEVER operate a self-priming pump unless the volute is filled with liquid. The pump will not prime when dry.

PUMP only liquids for which the pump has been designed to handle.

DO NOT pump flammable, corrosive or caustic materials unless the pump and piping are explicitly designed for that purpose.

NOTE the direction of rotation — operation of a pump in the wrong direction can cause the impeller to unscrew and damage the volute case.

A pump should not be operated against a closed valve or other no flow conditions. Refer to the pump manufacturer's recommended practice for start-up, operation and shut-down procedures. **DO NOT** close down or restrict a discharge hose. **Be careful** of discharge hose whipping under pressure.

MAKE CERTAIN that whatever is to be connected to he pump is not subjected to pressures greater than those given in the manufacturer's instructions.

MAKE CERTAIN all connections are securely made and hoses under pressure are secured, with appropriate safety devices, to prevent whipping.

BE AWARE OF LIGHTNING. Stay clear of the pumping equipment during electrical storms. It can attract lightning. (FIG. 10)

OVERHEATING PRECAUTIONS

Overheated pumps can cause severe damage to the equipment and can cause severe physical burns and injury.

Operating a pump with the suction and/or discharge valve closed is a principal cause of overheating. Approach cautiously any pump that has been in operation.

DO NOT remove hoses from a pump until the system is properly cooled to ambient temperature.

DO NOT remove the cover plate or drain plugs from any overheated pump. Allow the pump to cool. Check pump temperature before opening fill port or drain plug.

If overheating of the pump casing occurs:

- **STOP** the pump immediately.
- Allow the equipment to **cool completely**.
- Slowly and cautiously **vent the pump**.
- **Refer to the manufacturer's instruction** manual before restarting the unit.
- Remove hoses carefully. Heated water can be in hoses and static head produces pressure.

4

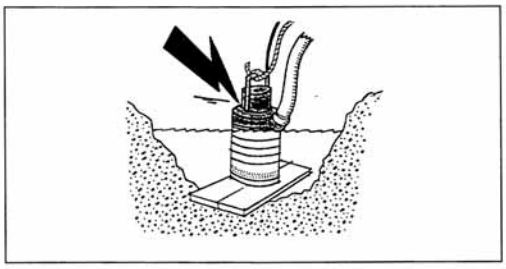


FIG. 10

WORK SAFELY – Pumps In General

BEFORE STARTING

Check the pump thoroughly at delivery for any shipping damage.

Locate the pump in an accessible location, as close to the liquid as possible.

Secure the pump after it is placed in its intended operating position so it does not tip, roll, slide or fall.

IMMEDIATELY ON STARTING THE PUMP

4

Observe gauges, instruments and warning lights to ensure that they are functioning and their readings are within the normal operating range.

- Be sure the immediate work area is safe for operation.
- Operate controls; make certain all operate properly and "feel" right. Accustom yourself to the "feel" of the equipment.
- Listen for any unusual noises, smell for any unusual odors; look for any signs of trouble.
- Be sure to open all manual valves slowly to prevent WATER HAMMER.
- Check all warning and safety devices and indicators.
- If safety-related defects or malfunctions are detected, SHUT DOWN the equipment. Correct the problem, or notify your supervisor. DO NOT OPERATE EQUIPMENT WITH DEFECTS OR MALFUNCTIONS UNTIL CORRECTED.
- **If an unsafe condition cannot be remedied immediately, notify your supervisor and tagout/lockout** the pump on the start switch and/or appropriate, prominent location. (FIG. 11)

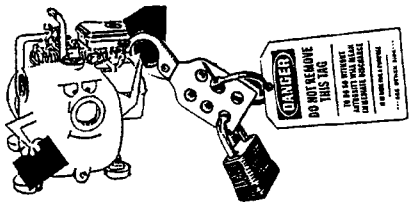


FIG. 11

SAFE WORKING PROCEDURES

Do not jump start engine battery.

When operating internal combustion engines in an enclosed area, always make provisions to pipe exhaust fumes to the outside.

EXHAUST FUMES CAN KILL: Do not operate engine driven pump equipment in a confined or enclosed space without adequate ventilation.

Exhaust gases are odorless and deadly poison.

DO NOT TOUCH: The exhaust system components get very hot and stay hot for some time after shutting the engine off.

Follow engine manufacturer's instructions explicitly on hand cranking.

Do not shut down high head pumps quickly:

A) Throttle back slowly

B) Open by-pass line

C) Should have a check valve

D) Slowly close gate valve on discharge if so equipped.

Check for fuel, oil and hydraulic fluid leaks, worn and damaged hoses/lines or power cables.

Refueling

When refueling, the following precautions must be followed:

- Add fuel of proper type and grade, only when the pump is not running and engine is cool.
- Fuel in well ventilated area.
- Turn off all electrical switches.
- Keep lighted smoking materials, flames or spark producing devices at a safe distance while refueling.
- Keep fuel nozzle in contact with tank being filled, or provide a ground to prevent static sparks from igniting fuel.
- **Do not spill fuel on hot surfaces.**
- Clean up spillage immediately.
- Do not start engine until fuel cap is secured to the fuel tank.
- **Always** make sure that fuel is being put in the fuel tank, motor oil in the proper location and hydraulic oil into hydraulic oil reservoirs.

5

WORK SAFELY — Engine Driven Pumps

Maintenance and Repair

All installations, operations and maintenance should be in accordance with pump and engine manufacturer's recommended operation and maintenance program. These manuals should be kept available with the equipment.

Maintenance work can be **hazardous** if not done in a careful manner. All personnel should realize the hazards and strictly follow safe practices.

NEVER perform any work on the equipment unless authorized to do so.

BEFORE ANY maintenance **work** is to be done, a LOCKOUT/TAGOUT standard device and procedure should be implemented. Prior to removal of LOCKOUT/TAGOUT, the equipment must be fully operational and all personnel accounted for. Except in cases of emergency, the removal of the LOCKOUT/TAGOUT should be done ONLY by the initiating person prior to the return to start-up (see page 12, Fig. 11).

BEFORE doing any major work, disconnect the ignition and battery if so equipped.

Always replace safety devices removed during service or repair before returning pump to operation.

5

Battery Servicing

- **Always wear** safety glasses and gloves when servicing or working with batteries.
- **Before servicing battery,** turn off electrical systems, then disconnect ground terminal clamp. Before installing a battery, turn off electrical equipment, then connect the battery ground clamp **last.**
- **Maintain** electrolyte at the recommended level. Check level frequently. Add distilled water to batteries only when starting up, never when shutting down.
- **Use a flashlight** to check level. **NEVER** use a flame.
- **Do not short** across battery terminals — the spark could ignite the battery gases.

  Battery acids will **burn skin**, eat holes in clothing, and can **cause blindness** if splashed in eyes.

  If you spill acid on yourself flush skin immediately with lots of water. Apply baking soda to help neutralize the acid. ***If acid gets into the eyes, flush immediately with large amounts of water and seek proper medical treatment immediately.***

SAFE WORKING PROCEDURES

***Allow only qualified personnel* to INSTALL, WIRE AND OPERATE** electric motor driven pumps. Whenever electricity is present there is the possibility of **electrocution.**

NEVER use a pump/motor in an explosive atmosphere if it is not exclusively designed for the application.

Always ground electrical units.

Make certain to connect pump motor to the right phase and voltage.

Do not run pump if voltage is not within limits.

Make sure motor rotation is in accordance with impeller rotation (which should be indicated somewhere on the pump — check the manufacturer's manual).

Make all electrical installations in accordance with National Electric Code, State and Local electrical codes.

Never use gas piping as an electrical ground.

Make sure the related electrical circuits are dead and locked out before performing any maintenance.

Follow motor manufacturer's recommended maintenance and operation instructions.

If circuit breaker or fuse is tripped, examine the system for the problem before restarting pump.

NEVER use the power cord to aid lifting the pump.

NEVER operate a pump with a plug-in type power cord without a ground fault circuit interrupter.

NEVER use cords with frayed, cut or brittle insulation. Check the cord on the pump for nicks in the insulation and for sound connections to the ground fault interrupter plug and motor.

NEVER let extension cords or the plug connections lay in water. Locate the pump so that the cord cannot fall into any water or be submerged by rising water, unless the pump is designed for such use.

NEVER handle energized power cords with wet hands.

MOTOR OVERLOAD: do not exceed the manufacturer's recommendation for maximum lift or discharge head. See manufacturer's published curve for proper sizing of motors. A misapplied motor can overheat.

6

WORK SAFELY — Electric Motor Driven Pumps

Pump Maintenance and Repair

MAKE SURE the pump is disconnected from the power source or the appropriate circuits are dead and OSHA Lockout/Tagout is applied before doing any maintenance or repair work on the pump.

Maintenance work can be **hazardous** if not done in a careful manner. All personnel should realize the hazards and strictly follow safe practices.

NEVER perform any work on the equipment unless authorized to do so. (FIG. 11) Before performing any maintenance or repair work, consult the manufacturer's instruction manual for recommended procedures.

Pumps with float switches or other automatic devices can start without warning if not properly locked out.

6

BEFORE ANY maintenance **work** is to be done, a LOCKOUT/TAGOUT standard device and procedure should be implemented. Prior to removal of LOCKOUT/TAGOUT, the equipment must be fully operational and all personnel accounted for. Except in cases of emergency, the removal of the LOCKOUT/TAGOUT should be done ONLY by the initiating person prior to the return to start-up.

ALWAYS replace safety devices removed during the service or repair before returning pump to operation.

NEVER use the power cord to aid in lifting the pump.

Sizing Extension Cords

Use the following chart to select the correct size extension cord to prevent excessive amperage draw or voltage drop which would cause the motor to overheat. **Cables that are too long or coiled** can cause a voltage drop. **Be aware** that strong sunlight can cause a voltage drop.

	Wire Gauge and Cord Length (in feet)		
Amperes	**50**	**100**	**150**
6	16	16	14
8	16	14	12
10	16	14	12
12	14	14	12
14	14	12	10
16	12	12	10

SAFE WORKING PROCEDURES

***ALLOW only qualified personnel* to INSTALL, WIRE and OPERATE** submersible pumps.

Whenever electricity is present there is the possibility of **electrocution.**

NEVER use a pump/motor in an explosive atmosphere, if it is not exclusively designed for that application.

ALWAYS ground the pump.

Make certain to connect the pump to the right phase and voltage.

DO NOT run the pump if voltage is not within limits. **Make all electrical installations** in accordance with National Electric Code, State and Local electrical codes.

Mount electrical control box in a vertical position, protected from the elements.

NEVER attempt to use the power cord or hydraulic hoses as a lifting or lowering device for submersibles. Attach a lifting cable to the manufacturer's recommended attachment point on the pump for lowering and lifting the pump. (FIG. 12)

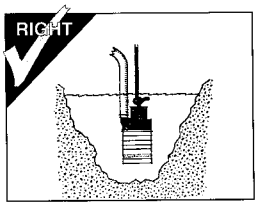


FIG. 12

NEVER position the pump directly on a soft, loose bottom. To attain maximum capacity and prevent excessive wear, position the pump so it will not burrow itself into sand or clay. Stand the pump on a plank, a bed of coarse gravel, within a perforated container, on a suitable floatation device, or retain it hanging freely by a lifting cable. (FIG. 13)

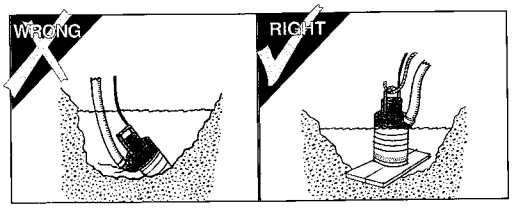


FIG. 13

WORK SAFELY — Submersibles

Pump Maintenance and Repair

MAKE SURE the pump is disconnected from the power source or the appropriate circuits are dead and OSHA Lockout/Tagout is applied before doing any maintenance or repair work on the unit.

Maintenance work can be **hazardous** if not done in a careful manner. All personnel should realize the hazards and strictly follow safe practices.

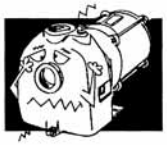
NEVER perform any work on the equipment unless authorized to do so. Before performing any maintenance or repair work, consult the manufacturer's instruction manual for recommended procedures.

BEFORE ANY maintenance **work** is to be done, a LOCKOUT/TAGOUT standard device and procedure should be implemented. Prior to removal of LOCKOUT/TAGOUT, the equipment must be fully operational and all personnel accounted for. Except in cases of emergency, the removal of the LOCKOUT/TAGOUT should be done ONLY by the initiating person prior to the return to start-up.

Check oil level ONLY when pump is cool.

USE ONLY recommended oil per manufacturer's recommendation.

INSPECT ELECTRICAL WIRING for worn or damaged insulation. **INSTALL** new wiring if wires are damaged. **After repairs are made, clean the equipment before putting the pump back into position.**



Do you understand this AEM SAFETY MANUAL AND ITEMS SUCH AS ...

- Your safety program?
- Your pump manufacturer's manual(s)?
- Proper clothing and personal safety equipment?
- Your pump's controls, warning signs and devices, and safety equipment?
- How to properly inspect, mount, and start your pump?
- How to check your pump for proper operation?
- Your work area and any special hazards that may exist?
- Proper operating procedures?
- Proper shutdown procedures?
- Proper maintenance procedures?
- Proper loading and unloading procedures for transporting?
- Under what conditions you should not operate your pump?

If you do not understand any of these items, consult with your supervisor BEFORE operating your equipment!

FINAL WORD TO THE USER

Remember that **YOU are the key to safety**. Good safety practices not only protect you but protect the people around you.

You have read this safety manual and the manufacturer's manual(s) for your specific pump. Make them a working part of your safety program. Keep in mind that this safety manual is written for only this type of equipment.

Practice all other usual and customary safe working precautions, and above all —

REMEMBER
SAFETY IS UP TO YOU

YOU CAN PREVENT SERIOUS INJURY OR DEATH

This manual is another in a series on the safe operation of machinery published by AEM.
For additional publications visit our web site at www.aem.org.

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FORM PP 130-2

EC DECLARATION OF CONFORMITY
CE-KONFORMITÄTSERKLÄRUNG
DECLARACIÓN DE CONFORMIDAD DE LA CE
DÉCLARATION DE CONFORMITÉ C.E.

WACKER CORPORATION, N92 W15000 ANTHONY AVENUE, MENOMONEE FALLS, WISCONSIN USA

AUTHORIZED REPRESENTATIVE IN THE EUROPEAN UNION BEVOLLMÄCHTIGTER VERTRETER FÜR DIE EUROPÄISCHE GEMEINSCHAFT REPRESENTANTE AUTORIZADO EN LA UNIÓN EUROPEA REPRÉSENTANT AGRÉÉ AUPRÈS DE L'UNION EUROPÉENNE	**WACKER CONSTRUCTION EQUIPMENT AG** **Preußenstraße 41** **80809 München**

hereby certifies that the construction equipment specified hereunder: / bescheinigt, daß das Baugerät: / certifica que la máquina de construcción: / atteste que le matériel :

1. Category / Art / Categoría / Catégorie

Water Pump Units
Wasserpumpen
Equipos de Bomba de Agua
Groupe Motopompe à Eau

2. Type - Typ - Tipo - Type

PDT 2A, PDT 3A, PDI 2A, PDI 3A, PDT 2, PDT 3, PDI 2, PDI 3

3. Item number of equipment / Artikelnummer / Número de referencia de la máquina / Numéro de référence du matériel :

0007610, 0007614, 0007624, 0007625, 0007628, 0007629, 0009407, 0009494, 0009495, 0009489, 0009491, 0009492

4. Net installed power / absolute installierte Leistung / Potencia instalada neta / Puissance installée nette :

PDT 2A, PDT 3A, PDI 2A, PDI 3A 3 kW
PDT 2, PDT 3, PDI 2, PDI 3 3.2 kW

Has been sound tested per Directive 2000/14/EC / In Übereinstimmung mit Richtlinie 2000/14/EG bewertet worden ist / Ha sido ensayado en conformidad con la norma 2000/14/CE / A été mis à l'épreuve conforme aux dispositions de la directive 2000/14/CEE :

Conformity Assessment Procedure / Konformitätsbewertungsverfahren / Procedimiento para ensayar conformidad / Procédé pour l'épreuve de conformité	Measured sound power level / Gemessener Schallleistungspegel / Nivel de potencia acústica determinado / Niveau de puissance acoustique fixé	Guaranteed sound power level/ Garantierter Schallleistungspegel / Nivel de potencia acústica garantizado / Niveau de puissance acoustique garanti
Annex V / Anhang V **Anexo V / Annexe V**	**95 dB(A)**	**96 dB(A)**

and has been produced in accordance with the following standards:
und in Übereinstimmung mit folgenden Richtlinien hergestellt worden ist:
y ha sido fabricado en conformidad con las siguientes normas:
et a été produit conforme aux dispositions des directives européennes ci-après :

2000/14/EC
2002/88/EC
89/336/EEC
98/37/EEC

William Lahner
Vice President of Engineering

Dan Domanski
Manager, Product Engineering

09.02.05
Date / Datum / Fecha / Date

WACKER CORPORATION

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